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EXAMINER

NATNAEL, PAULOS M

ART UNIT

PAPER NUMBER

2614

5

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/923,676

Applicant(s)

LIU ET AL.

Examiner

Paulos M. Natnael

Art Unit

2614

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-21 and 23-30 is/are rejected.
- 7) ☒ Claim(s) 22 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>4</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims **12, 13, 16, 17, 23-25** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lindemeier et al., U.S. Pat. No. 5,335,010.

Considering claim **12**, a receiver for intercepting a modulated radio signal, the receiver comprising:

- a) a plurality of antennas...to produce a corresponding plurality of input signals, is met by antennae inputs 11, Fig.1;
- b) means for evaluating the quality of the plurality of input signals, is met by signal quality evaluation circuit 7, fig.1;
- c) a signal processor for demodulating a signal applied to its input, is met by TV receiver 2, fig.1;
- d) means responsive to the evaluating means for connecting one of the antennas to the

Art Unit: 2614

input of the signal processor based on the quality of the input signals, is met by control circuit and antenna switching until 10, fig. 1;

Except for;

e) the antennas having different directionality;

Regarding e), Lindemeier does not specifically disclose the type of antenna they are using. However, the examiner takes Official Notice in that fixed beam antennas having different directionality are notoriously well known in the art and, therefore, it would have been obvious to the skilled in the television art at the time the invention was made to modify the system of Lindemeier et al. by providing such antenna in order to maximize the quality of the intercepted signals.

Considering claim **13**, the receiver of claim 12, in which the connecting means comprises a switch, is met by antenna switching unit 10, fig.1;

Considering claim **16**. A receiver for intercepting a modulated radio signal, the receiver comprising:

a plurality of antennas having different directionality to produce a corresponding plurality of input signals;

means for evaluating the quality of the plurality of input signals;

a plurality of signal processors connected to the respective antennas for demodulating the respective plurality of input signals;

a utilization circuit; and means responsive to the evaluating means for connecting one of the signal processors to the utilization circuit based on the quality of the input signals.

See rejection of claim 12;

Considering claim 17. The receiver of claim 16, in which the connecting means comprises a switch.

See rejection of claim 13;

Considering claim **23**, a receiver for intercepting a modulated radio signal, the receiver comprising:

a plurality of antennas having different directionality to produce a corresponding plurality of input signals;

means for evaluating the quality of one or more criteria of the input signals;

a plurality of signal processors connected to the respective antennas for demodulating the respective plurality of input signals;

a utilization circuit; and

means responsive to the evaluating means for connecting one of the signal processors to the utilization circuit based on the quality of the input signals.

See rejection of claims 12 and 16;

Art Unit: 2614

Considering claim **24**, the receiver of claim 23, in which the one or more criteria comprise one or more of the SNR, SER, SMS, FEC, FFE, and DFE, , is met by the disclosure "Each antenna input 11 is connected to a signal input 22 of the signal selector 20 through an amplitude weighting element 25. These amplitude weighting elements 25 are arranged such that the mean values of the received signals at the selector inputs 22 are equally large. If antennas comprising amplifiers are used, the amplitude weighting elements 25 are adjusted such that the signal-to-noise ratios at the selector inputs 22 are substantially equal.." (col. 7 line 8, lines 1-4) {emphasis added by examiner}

Considering claim **25**, the receiver of claim 23, in which the one or more criteria comprise SNR and one or more of the, SER, SMS, FEC, FFE, and DFE.

See rejection of claim 24;

3. Claims **1-11, 14,15,18-21, 26-30** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lindemeier et al., U.S. Pat. No. 5,335,010 in view of Steward, U.S. Pat. No. 6,707,861.

Considering claim **1**, a method for receiving a digital television signal comprising the steps of:

a) intercepting a digital television signal with a plurality of antennas having different directionality to produce a corresponding plurality of input signals, is met by antennae inputs 11, Fig.1;

b) combining the input signals to reduce multi-path echoes, is met by antenna switching unit 10, Figs.1 and 6-8;

Except for;

c) subjecting the input signals to VSB processing to produce a single VSB processed signal;

d) decoding the VSB processed signal to form a display drive signal.

Regarding c) and d), Lindemeier discloses an antenna diversity receiving system with antenna switching during line periods and signal quality evaluation during line blanking intervals. Lindemeier et al. disclose that "the weighting elements 25 and the phase shifters 24 can be adjusted by the control circuit 8 by means of the binary address signal 9. In order to make a distinction as to whether the address signal is to trigger the signal selector or the antenna combiner, the control circuit can generate a codeword and add same to the address signal. When it is assumed that an appropriate decoding takes place in the signal selector and in the antenna combiner, an unambiguous allocation is provided." (col. 7, lines 7-15) Furthermore, Lindemeier teaches antenna switching unit 10, TV receiver 2, and signal quality evaluation circuit 7.

Although Lindemeier does not specifically disclose a Vestigial Sideband (VSB) processing, VSB processing is well known in the art. In that regard, Stewart discloses a

demodulator for an HDTV receiver. Stewart teaches a receiver for processing a VSB modulated signal containing terrestrial broadcast high definition television information and a pilot component includes a carrier recovery network. Therefore, it would have been obvious to the skilled in the television art at the time the invention was made to modify the system of Lindemeier et al. by providing the VSB processing circuitry of Stewart in order for the system of Lindemeier to be more versatile and useful to the viewer.

Considering claim 2, the method of claim 1, in which the combining step weights the input signals to produce a combined signal, is met by antenna combiner 21 fig. 6, which includes amplitude weighting elements 24 and phase control elements 25.

Considering claim 3, the method of claim 2, in which the weights of all the input signals but one are zero.

Considering claim 4, the method of claim 2, in which the weights of all the input signals are non-zero.

Considering claim 5, the method of claim 2, in which the weights of all the input signals are different, is implied because the signals are of different strength.

Considering claim 6, the method of claim 1, in which the intercepting step uses a plurality of fixed beam antennas having different directionality;

Lindemeier does not specifically disclose the type of antenna they are using. However, the examiner takes Official Notice in that fixed beam antennas having different directionality are notoriously well known in the art and, therefore, it would have been obvious to the skilled in the television art at the time the invention was made to modify the system of Lindemeier et al. by providing such antenna in order to maximize the quality of the intercepted signals.

Considering claim 7, the method of claim 1, in which the intercepting step uses a plurality of swept beam antennas having the same directionality.

Lindemeier does not specifically disclose the type of antenna they are using. However, the examiner takes Official Notice in that swept beam antennas having the same directionality are notoriously well known in the art and, therefore, it would have been obvious to the skilled in the television art at the time the invention was made to modify the system of Lindemeier et al. by providing such antenna in order to maximize the quality of the intercepted signals.

Considering claim 8, the method of claim 1, in which the step of combining the input signals takes place before the step of subjecting the input signals to VSB processing;

Regarding claim 8, see rejection of claim 1;

Considering claim **9**, the method of claim 1, in which the step of combining the input signals takes place after the step of subjecting the input signals to VSB processing.

See rejection of claim 1;

Considering claim **10**, the method of claim 1, additionally comprising the step of forward error correcting the VSB signal before decoding the VSB signal.

The combination of Lindemeier et al. and Steward as modified above, does not specifically disclose FEC processing. However, the examiner takes Official Notice in that FEC processing is notoriously well known in the art and, therefore, it would have been obvious to the skilled in the television art at the time the invention was made to modify the system of Lindemeier et al. by providing processing in order to make adequate error correction before or after video processing.

Considering claim **11**, the method of claim 1, in which the intercepting step intercepts a terrestrial signal, is met by input antenna 11, Fig.1;

Considering claim **14**, the receiver of claim 13, in which the radio signal comprises a digital television signal and the signal processor comprises a VSB processor.

Regarding claim 14, see rejection of claim 1 above.

Considering claim **15**, the receiver of claim 14, in which the radio signal comprises a digital television signal with QAM modulation and the signal processor comprises a VSB processor with forward error correction.

Regarding claim 15, Lindemeier does not disclose QAM Modulation and VSB processing. However, QAM and VSB are well known in the television art. Stewart discloses that "The 8-VSB modulated digital symbol datastream from ADC 19, containing the very low frequency pilot component, is applied to Hilbert filter 315 that separates the incoming IF sampled datastream into mutually quadrature phased components "I" (in phase) and "Q" (quadrature phase). The I and Q components are rotated to baseband using complex multiplier 324 in an automatic phase control (APC) loop. Once the loop is synchronized, the output of multiplier 324 is a complex baseband signal that is further phase adjusted by network 350, as will be discussed, to produce a final phase corrected demodulated output from unit 350. The output I datastream from multiplier 324 is used to extract the pilot component of the received datastream. The output Q datastream from multiplier 324 is used to extract the phase of the received signal." (col. 3, lines 34-48) Therefore, it would have been obvious to the skilled in the television art at the time the invention was made to modify the system of Lindemeier et al. by providing the QAM modulation and VSB processing circuitry of Stewart in order for the system of Lindemeier to be more versatile and useful to the viewer.

Considering claim **18**, the receiver of claim 17, in which the utilization circuit comprises a VSB receiver and forward error correction means.

See rejection of claim 15.

Considering claim **19**, the receiver of claim 18, in which the radio signal comprises a digital television signal with QAM modulation and the utilization circuit comprises a VSB processor with forward error correction.

See rejection of claim 15 as well.

Considering claim 20, the receiver of 19, in which the utilization circuit additionally comprises an MPEG decoder.

Lindemeier discloses the circuit 1 comprises a decoding capability. However, as shown above it would have been obvious to the skilled in the television art at the time the invention was made to modify the system of Lindemeier et al. by providing trellis decoder of Stewart in order for the system of Lindemeier to be more versatile in processing digital tv signals.

Considering claim **21**, the receiver of claim of 20, in which the signal processors each have a tuner and the receiver has means for setting the tuners to the same channel in a diversity or scanned array mode, is met by TV receiver 2, fig.1; (see col. 10, lines 3-20)

Considering claim **26**, the method of claim 1, in which the combining step evaluates the quality of the input signals and the subjecting step produces the single VSB signal based on the evaluation, is met by the signal quality evaluation circuit 7, fig.1; (See also rejection of claim 1)

Considering claim **27**, the method of claim 26, in which the digital television signal is arranged as video lines and the video lines are arranged as video frames such that combining step evaluates the quality of the input signals on a line by line or frame by frame basis.

See rejection of claim 26. (see also col. 8, lines 46-54 disclosing for line-by-line processing)

Considering claim **28**, a method for receiving a television signal arranged as video lines and the video lines are arranged as video frames, the method comprising the steps of: intercepting a digital television signal with a plurality of antennas having different directionality to produce a corresponding plurality of input signals:

- a) evaluating the quality of the input signals on a line by line or frame by frame basis;
- b) combining the evaluated input signals to produce a single VSB processed signal that reduces the effects of multi-path echoes;
- c) decoding the VSB processed signal to form a display drive signal.

Claim **28** is a method claim of claim 1 and, therefore, claim 28 is rejected for the same reasons as in claim 1;

Considering claim **29**, the method of claim 28, in which the television signal is a digital television signal.

Regarding e), Lindemeier does not specifically disclose digital television signals. However, the examiner takes Official Notice in that receiving digital television signals is notoriously well known in the art and, therefore, it would have been obvious to the skilled in the television art at the time the invention was made to modify the system of Lindemeier et al. by providing such circuitry that would receive digital television signal so that the system of Lindemeier would be made more useful.

Considering claim **30**, a receiver for intercepting a modulated radio signal having a defined format; the receiver comprising:

- a) a plurality of antennas having different directionality to produce a corresponding plurality of input signals;
- b) means for evaluating the quality of the plurality of input signals on a line by line or frame by frame basis;
- c) a signal processor for demodulating a signal applied to its input; and
- d) means responsive to the evaluating means for connecting one of the antennas to the input of the signal processor based on the quality of the input signals.

See rejection of claims 1 and 12.

Allowable Subject Matter

4. Claim **22** is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

5. The following is a statement of reasons for the indication of allowable subject matter: the prior art fails to disclose in which a TV receiver has means for setting the tuners to different channels in a two signal mode and means responsive to the evaluating means in the two signal mode for connecting both of the signal processors to one or the other or both of the antennas in the two channel mode, as claim **22**.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

De Bot, U.S. Pat. No. 5,528,581 discloses a diversity transmission system for sub-band diversity reception.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ***Paulos M. Natnael*** whose telephone number is (703) 305-0019. The examiner can normally be reached on 9:00am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **John Miller** can be reached on (703) 305-4795. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PMN
May 7, 2004

PAULOS M. NATHAEL
PATENT EXAMINER